

NON-PUBLIC?: N
ACCESSION #: 9110280296
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Nine Mile Point Unit 1 PAGE: 1 OF 05

DOCKET NUMBER: 05000220

TITLE: Reactor Scram Caused by Main Generator Trip Due to Failed Current Transformer

EVENT DATE: 09/26/91 LER #: 91-012-00 REPORT DATE: 10/15/91

OTHER FACILITIES INVOLVED: N/A DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 097

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Curtis Fischer, General Supervisor TELEPHONE: (315) 349-2806
Electrical Maintenance

COMPONENT FAILURE DESCRIPTION:

CAUSE: SYSTEM: COMPONENT: MANUFACTURER:

REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On September 26, 1991, at 1728 hours, Nine Mile Point Unit 1 experienced Engineered Safety Feature (ESF) and Reactor Protective System (RPS) actuations. Specifically, a full reactor scram and a High Pressure Coolant Injection (HPCI) automatic initiation caused by a Main Generator trip. At the time of the event, the reactor mode switch was in the "RUN" position and reactor power was at approximately 97 percent power.

The cause of the Main Generator trip was the failure of one of three Unit Overall Differential Trip Relay Current Transformers installed on phase two neutral side of the Main Generator. A root cause investigation of the failed Current Transformer determined the failure was caused by moderately high localized temperature over a significant period of time.

The immediate corrective action was to respond to the scram and ensure

safe shutdown conditions. Other completed corrective actions include evaluation of all Current Transformers associated with the Main Generator Protective Relaying Circuitry and replacement of the failed transformer and the other two Current Transformers mounted on phase two neutral. Periodic thermographic surveillance of Current Transformers will be implemented to preclude Main Generator trips caused by a failed Current Transformer.

END OF ABSTRACT

TEXT PAGE 2 OF 5

I. DESCRIPTION OF EVENT

On September 26, 1991, at 1728 hours, Nine Mile Point Unit 1 experienced Engineering Safety Feature (ESF) and Reactor Protective System (RPS) actuations. Specifically, a full reactor scram and a High Pressure Coolant Injection (HPCI) automatic initiation caused by a Main Generator trip. At the time of the event, the reactor mode switch was in the "RUN" position and reactor power was at approximately 97 percent power.

Following the scram signal, all control rods inserted to position 00 and the Main Turbine Bypass Valves and Electromatic Relief Valves operated to control pressure. Reactor water level decreased to a minimum of 35 inches during the scram and was restored by the HPCI System to within the normal operating range of 65 to 83 inches at approximately 1729 hours. The scram was reset at 1738 hours.

A normal shutdown after a scram was initiated using N1-OP-43, "Startup, Normal Operation and Shutdown Procedure," and the plant was placed in a cold SHUTDOWN condition. The 4 hour non-emergency telephone notification to the Nuclear Regulatory Commission (NRC) was made at 1945 hours, September 26, 1991, in accordance with 10CFR50.72 (b)(2)(ii).

II. CAUSE OF EVENT

The cause of the Main Generator trip was the failure of one of three Unit Overall Differential Trip Relay Current Transformers installed on phase two neutral side of the Main Generator. It was determined that the failed Current Transformer had become saturated and that this saturation was sufficient to trip the Unit Overall Differential Relay (device 87T-2) which, in turn, trips the Main Generator via the lock out relay (device 86G1).

A root cause investigation was conducted in accordance with Nuclear Division Procedure 16.01 (NDP-16.01), "Root Cause Evaluations," to

determine the cause for the failure of the Current Transformer. The investigation determined that the failure was a turn-to-turn short caused by moderately high temperature in the region immediately surrounding the Current Transformer's integral junction box over a protracted period of time. The transformer had been in service for twenty-two (22) years.

III. ANALYSIS OF EVENT

This condition is reportable in accordance with 10CFR50.73 (a)(2)(iv), "Any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF) including the Reactor Protection System (RPS)."

TEXT PAGE 3 OF 5

III. ANALYSIS OF EVENT (cont.)

The Current Transformer is a component within the Unit Overall Differential Relay circuit. This circuit detects any phase-to-phase current imbalance between the Main Generator output, the 24KV Iso-Phase Bus and the Main Transformer. A current imbalance exceeding the relay setpoint will operate the relay resulting in a main generator trip to prevent component damage. The Unit Overall Differential Relay serves as the primary protection for the 24 KV Iso-Phase Bus and also provides secondary protection for the Main Generator and Main Transformer.

This Main Generator trip event is bounded by the discussion in the Final Safety Analysis Report (FSAR) section IX.3.19. There were no adverse safety consequences as a result of this event nor was the reactor in an unsafe condition during or as a result of this event.

During this event, all plant systems functioned as designed, operator responses were correct and there was no release of radioactivity. There were no adverse consequences to the health and safety of the general public or plant personnel as a result of this event.

IV. CORRECTIVE ACTIONS

Short term corrective actions were:

A. Stabilized and cooled down the reactor in accordance with plant procedures.

B. Initiated Work Request 195276 to inspect and repair protective relays and devices associated with main power distribution.

C. Completed a root cause evaluation for Current Transformer failure.

Long term corrective actions include:

A. Replaced the failed Current Transformer and the other two Current Transformers on the phase two neutral side of the Main Generator.

B. Evaluated and tested Current Transformers and relays associated with the Main Generator Protective Relaying Circuitry. This evaluation determined that immediate replacement of other Current Transformers on the neutral side or on the line side is not required.

TEXT PAGE 4 OF 5

IV. CORRECTIVE ACTIONS (cont.)

C. To preclude recurrence of Main Generator trips caused by failure of a Current Transformer, periodic thermographic surveillance of operating Current Transformers will be implemented. The resultant data will be evaluated and trended to determine degrading conditions. Appropriate corrective actions will be implemented if degraded conditions are detected.

V. ADDITIONAL INFORMATION

A. Failed component: Current transformer

Manufacturer - General Electric

Catalog - 87H174

Type - BR Y

GEI - 49539

NP - 174801

Operating Voltage - 24kv

Rated Primary Current - 20,000 Amperes

Rated Secondary Current - 5 Amperes

B. Previous similar events: none.

There have been previous Main Generator trips and ESF/RPS actuations. However, none of these previous events were caused by failure of a Main Generator Protective Relaying Circuitry Current Transformer. The corrective actions for those previous events would not have prevented this event.

TEXT PAGE 5 OF 5

V. ADDITIONAL INFORMATION (cont.)

C. Identification of components referred to within this report:

COMPONENT IEEE 803 FUNCTION IEEE 805 SYSTEM

Reactor Protective System N/A JC
Main Generator GEN TB
High Pressure Coolant Injection N/A BJ
Unit Overall Differential 87 JC
Trip Relay
Current Transformer XCT JC
Main Generator Protective N/A JC
Relaying Circuitry
Main Turbine Bypass Valves N/A SB
Electromatic Relief Valves RV SB
Lockout Relay 86 JC
Iso-Phase Bus BU EL
Main Generator GEN EL
Main Transformer ET EL

ATTACHMENT 1 TO 9110280296 PAGE 1 OF 1

NIAGARA
MOHAWK
NINE MILE POINT NUCLEAR STATION / P.O. BOX 32 LYCOMING, NEW YORK
13093
TELEPHONE (315) 343-2110

Joseph F. Firlit NMP83144
Vice President
Nuclear Generation

October 15, 1991

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

RE: Docket No. 50-220
LER 91-12

Gentlemen:

In accordance with 10CFR50.73, we hereby submit the following Licensee

Event Report.

LER 91 -12 Which is being submitted in accordance with 10CFR50.73 (a)(2)(iv), "Any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS). However, actuation of an ESF, including the RPS, that resulted from and was part of the preplanned sequence during testing or reactor operation need not be reported".

A 10CFR50.72 report was made at 1945 hours on September 26, 1991.

This report was completed in the format designated in NUREG-1022, Supplement 2, dated September 1985.

Very truly yours,

Joseph F. Firlit
Vice President - Nuclear Generation

JFF/AC/lmc

ATTACHMENT

xc: Thomas T. Martin, Regional Administrator Region I
William A. Cook, Sr. Resident Inspector

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